The REASON WHY

"The BATTLE CREEK IDEA"

Battle Creek Sanitarium.

THE REASON WHY

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1913

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Battle Creek, Michigan.

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THE purpose of this brochure is to answer briefly and simply a large number of questions which are daily asked, demanding a reason for various characteristic features of the curative regimen and methods of health training which within recent years has come to be known as the Battle Creek Sanitarium System.

First of all, it should be said that these methods and principles do not rest upon merely theoretical or empirical grounds. It should be acknowledged also that only a few of the characteristic features of this regimen have originated in Battle Creek. The Battle Creek Sanitarium System professes to be nothing more or less than a thoroughly up-to-date, scientific and progressive system of health culture for the sick and the well. It is unique only in that it represents the pioneer attempt to organize under one management the best results of experience and the latest findings of medical science in everything pertaining to health culture and the treatment of the sick.

Its claim for confidence rests, first, upon well-established physiological facts, the outgrowth of extended laboratory research by numerous observers in various parts of the world; and second, upon the provings of intelligent and carefully controlled experience, the winnowed results of which have been accumulating for nearly a century and have finally crystallized into practical and proved facts, especially within the last twenty-five years.

The chief merit claimed for the Battle Creek Sanitarium System is that it is not a novelty or in any sense a new departure, but rather, like the "Brook Farm" experiment of Ripley, Wendell Phillips, Emerson, Alcott, Thoreau, and their colleagues, "an effort to return to nature." On the occasion of his visit to the Battle Creek Sanitarium some years before his death, the Concord Philosopher, Bronson Alcott, recognized in the enterprise the successful working out of some of the

ideals of the Brook Farm experiment. The Brook Farm effort failed for lack of financial support, but the idea of a return to natural, wholesome ways, of cultivating sympathy with nature, was a spark from Heaven's altar which could not be extinguished, a divine thought born into the world with a great purpose behind it, to meet the needs of a suffering race and stem the tide of invalidism and inefficiency.

The Mystery of Healing

In these days, when prophets of healing are rising in all directions and crying, "Lo here, and lo there," when mind healers, faith healers, and layers on of hands, along with patent medicine vendors and the purveyors of magnetic insoles, electric hair brushes, and mineral waters, savory and unsavory, are fattening upon the gullibility of the public in matters which pertain to health-getting, it is essential that the invalid should obtain, if possible, a clear idea of the nature of the healing process, and how the work of curing the sick man is carried on.

The fundamental principle recognized by the Battle Creek Sanitarium is that expressed by Dietl, the pupil of the famous German pathologist, Rokitanski: "*Nature alone can cure; this is the highest law of practical medicine, and the one to which we must adhere. . . . Nature creates and maintains; she must therefore be able to cure.*"

The healing power is in the blood; it is the blood that heals, or rather, the creative power which formed the body in the first place, and which repairs the damage done by the wear and tear of life. It is this same power which restores disordered functions and repairs damaged tissue. Physicians do not and cannot heal.

Medicines, baths, and other so-called remedial measures are powerless to heal. All that physicians and remedies can do is to aid in removing causes

of disease and supplying favorable conditions. Physiological measures, such as water, electricity, massage, exercise, and sunlight, regulation of diet and clothing, possess a wonderful controlling influence over the healing power of the body by regulating the movement of the blood, the greatest of all remedial agencies; and by stimulating the vital activities and controlling the vital forces by which the healing process is carried on.

Physiological Remedies

The most important measures which can be employed in dealing with the sick may be said to be *fresh air*, *baths*, *exercise*, and *diet*. The chronic invalid can be made well only by being reconstructed. The sick man must be transformed into a healthy man by a process of gradual change. Little by little the old tissues must be torn down and new tissues built in their place.

By means of exercise the movement of the blood is accelerated and the old diseased tissues are broken down and carried out of the body. Exercise always diminishes weight. Cold baths stimulate the destruction of tissues, increase the activity of the heart and of all the vital functions, encourage the formation of the digestive fluids, and increase the appetite for food. Warm baths increase the elimination of waste substances. A dietary consisting of pure food substances of a character to be easily digested and assimilated, is the proper material with which to construct a new and healthy body. Thus baths, exercise, and a natural dietary constitute a therapeutic trio, each member of which is a complement to the others.

Health-getting, for the chronic invalid, is chiefly a matter of training, of health culture, under favorable conditions, which include the discarding of all disease-producing habits, such as the use of tobacco,

tea, coffee, and all irritating, indigestible, and disease-producing foods.

Hydrotherapy, phototherapy, mechanotherapy, vibrotherapy, manual Swedish movements, massage, the X-ray, electricity in its various forms,—the high frequency current, static, sinusoidal, etc.,—all these and other natural means are of invaluable service when employed, either severally or in combination, to uproot diseased conditions.

Examinations and Tests

In addition to the ordinary examination, which covers the history of the patient's malady, an account of his habits of life, his ancestry and other facts relating to his personal history, a thorough understanding of the real conditions present in a case of chronic disease requires a series of special examinations, which, for the most part, are made possible only by methods and appliances discovered in comparatively recent times. Some of the most important examinations and the reasons therefor are as follows:

Blood Examination. This important examination is made in every case. The blood is the life. If the number of blood cells present is only 75 or 50 per cent of the normal, the defensive and healing power of the body, its vigor and vitality, are 25 to 50 per cent below the normal standard. The vital forces are proportionately weak. The blood examination comprises a careful examination of the blood cells, a determination of the proportion of coloring matter present, a study of the different kinds of white cells, and other determinations. The examination not only makes certain whether or not anemia is present but yields information otherwise unobtainable concerning the possible presence of many other grave diseases.

This examination is taken as soon as possible after the patient arrives, and where any departure from normal conditions is observed, the examinations

should be repeated every two weeks while the patient remains under treatment, the final examination being made just before going home.

Determination of Blood Pressure. This highly important test, although not yet in general use, has been made a routine feature of examinations at the Battle Creek Sanitarium for many years. It is one of the means by which the presence of grave diseases, especially of the kidneys and blood-vessels, is determined, while still in an incipient and curable stage. The normal blood-pressure is 90 to 110. A permanent increase of blood-pressure to 130 or 140, or, as found in some cases, to 250 or more, is an indication of obstruction in the circulation due to spasm of the blood-vessels, or to narrowing or obliteration of the vessels through hardening of the arteries. This elevation of blood-pressure is one of the early symptoms of grave disease of the kidneys or blood-vessels. When recognized soon enough, this diseased process may be arrested, and in many cases great improvement may be effected. When the blood-pressure is found above normal, unremitting efforts should be made to reduce the pressure to the normal, not by means of drugs, but by removing the causes of the condition, of which the high blood-pressure is merely a symptom. In advanced cases of disease of the blood-vessels, the pressure is low because of progressive weakening of the heart. This condition, known as secondary low pressure, is much more serious than that in which the blood-pressure is high. One of the first symptoms of improvement in cases of this sort is an increase in the blood-pressure. Cases are sometimes observed in which the blood-pressure rises 25 to 50 points after beginning treatment.

With the higher blood-pressure there is improved nutrition through a better blood supply to the tissues, and in favorable cases the blood-pressure then gradually falls under the influence of treatment.

Both the systolic and diastolic pressure are obtained. The difference between the diastolic and systolic pressure is known as pulse pressure. This should never be more than 25 or 30. A lower or a higher pulse pressure is indicative of disease. When there is any marked deviation from the normal pressure, the examination should be repeated at least every week.

The Gastric Examination. By means of this examination, made in connection with a test meal, accurate information is secured concerning the functions of the stomach, and a regimen of treatment determined both as to diet and other measures. The gastric examination reveals the quantity of gastric acid present, the presence or absence of pepsin, of bacteria, of abnormal fermentations, of mucus and other indications of gastric catarrh, or other morbid conditions. The motility of the stomach—its ability to empty itself of its contents—is also determined by this examination. Another highly important fact which may generally be settled by this examination is the complete or partial obstruction of the pylorus, a condition which, once considered hopeless, may now be successfully dealt with. Thoroughgoing and systematic examinations of the stomach have been conducted in the laboratories of the Battle Creek Sanitarium on a more extensive scale and for a longer period than at any other place in this country, over 30,000 examinations having been made to date.

The usual gastric examination is made by means of the Ewald test breakfast. A test supper is used in special cases when there is ground for suspicion that there is obstruction at the pylorus preventing the proper emptying of the stomach.

The Bismuth Meal. The bismuth meal is one of the most useful of all the applications of X-rays in the investigation of disease. This meal involves none of the inconvenience to the patient which necessarily accompanies the ordinary test

breakfast. The bismuth meal consists of a small quantity of food to which bismuth or some similar substance has been added. After the food is swallowed, observations are made by the X-ray and the time is noted when the stomach is emptied; also when the bismuth meal appears at different points along the alimentary canal. By the careful study of normal persons, the time required for the movement of the food mass from one part of the alimentary canal to another has been definitely determined; also the length of time which it is normally retained in the stomach, the cecum and other parts of the intestine. In certain forms of disease, the movement of the food along the canal is accelerated, but more often it is delayed in some parts, especially in the stomach and the colon.

By means of X-ray examinations of the stomach, it is now possible to determine the exact shape, size and location of this organ and to actually follow its activities with the eye, thus making clear many conditions which were formerly highly problematical. It is also possible to determine the location of ulcers, cancers or other growths, "kinks," adhesions, and various malformations.

By means of *stereo-radiography*, the application of which to the intestine was first perfected in the laboratory of this institution, the stomach and intestine, as well as other organs of the abdominal viscera, may be more minutely scrutinized than was possible by the old methods, thus making it possible to determine with great accuracy the character and location of diseased conditions of the stomach and intestine, the diagnosis of which was formerly exceedingly obscure.

By means of the recently perfected Roentgen cinematograph it is now possible to make radiographs of the stomach and certain other internal parts in action. This new method of examination gives important information in cases in which a diagnosis would be otherwise impossible.

X-ray examinations render invaluable service in the investigation of disease of the heart and lungs.

Urinary Examination. This examination serves two purposes of the highest importance, first, to discover whether the kidneys are diseased, and second, to ascertain the condition of the blood and the general state of the body, especially with reference to such maladies as intestinal autointoxication and diabetes.

The Renal Efficiency Test. By means of recent discoveries it is now possible to determine with very great accuracy the efficiency of the kidneys, thus making it possible to judge of the degree to which the kidneys have been disabled by disease. This examination is of very great importance not only as an aid to prognosis but especially in surgical cases as a means of determining the ability of a patient to bear the administration of an anesthetic and of selecting the anesthetic used.

Examinations of the Liver, Pancreas and Other Viscera. These organs, formerly regarded as beyond the reach of investigation during life, are now made to reveal much concerning their condition by means of special tests for hepatic and pancreatic efficiency. Ordinary examinations of the urine give comparatively little information, because the urine is influenced to such a large degree by the character of the food. By placing the patient upon a special dietary for a definite period, during which the urine is collected, and by comparing the results with the data secured from the examination of healthy persons under like conditions, information of the most practical significance is obtained. By the use of the urinary test ration or special urinary research, first undertaken systematically at this institution, new standards for the accurate study of the urine in conditions of disease have been worked out in our clinical laboratories.

By special examinations of the urine and feces it is now possible to determine with very considerable

accuracy the efficiency of the liver and also of the pancreas, an organ the disorders of which have until within recent years been in the highest degree obscure.

Fecal Examination. The examination of the end products of digestion as found in the stools or fecal discharges must be regarded as equal in importance to any other examination which can be made. Enormous light has been thrown upon digestive disorders and large classes of chronic maladies by careful examination of the stools through the methods devised by Schmidt and others. The system of examination of the stools employed in the laboratories of the Battle Creek Sanitarium is the most thoroughgoing in use. This examination not only determines the presence or absence of intestinal parasites, such as tapeworm, hookworm, amœba, etc., but indicates the kind of bacteria present, and hence gives the key to the character of the fermentations taking place in the intestines, and the nature and amount of the bacterial toxins produced.

In cases of intestinal autointoxication, which are exceedingly common, the dominant species of micro-organisms are found to be putrefactive bacteria, which produce a prodigious amount of pernicious toxins. Absorbed into the blood, these toxins cause degeneration of the walls of the blood-vessels and ultimate degeneration of the liver, kidneys, thyroid glands and other important vital organs, besides giving rise to such distressing symptoms as headache, nervousness, nervous exhaustion, pigmentation of the skin and various skin eruptions, high blood-pressure, irritability, loss of memory, etc. Examination of the stools, made immediately after the arrival of the patient and repeated at intervals of a week or two, affords an opportunity to watch the gradual change of the intestinal flora from a noxious to a friendly sort, under the influence

of an antitoxic diet and the use of Yogurt, Glycobacter and other antitoxic ferments.

Strength Tests. By means of the Universal Dynamometer, an instrument devised at this institution and now in use by the United States Government at its Military and Naval Academies, as well as by the leading gymnasiums of the country, the strength of each group of muscles and the aggregate strength of the body is accurately tested. By successive examinations at intervals of a week or two, the progress of the patient's gain in strength under carefully graduated gymnastic training may be readily noted. An aggregate strength gain of 500 to 1,000 pounds in a single week is frequently observed. The results of the tests are plotted on the Strength Graphic, a copy of which is given to each patient. This chart represents in a graphic and easily comprehensible manner the exact relation of the strength of each group of muscles to the normal standard for a person of the same height. The height and weight coefficient obtained by this comparison with the normal standard indicates whether the patient is over weight or under weight. A dozen or more important physical coefficients are thus worked out by means of the Universal Dynamometer.

The Metabolism Chart. In cases requiring it, such as diabetes, obesity, emaciation, and other special cases, the graphic method is applied to a study of the patient's metabolism, by which the state of his nutritive processes, his utilization of various foodstuffs, loss or gain of tissue, etc., is readily determined. The data combined in this study is obtained from the urinary examination, the strength-graphic, the respiration calorimeter, and the daily ration.

Examinations of the Eye, Ear and Nose. Examinations of these organs are often of the highest importance in cases of chronic disease, not only to ascertain the presence or absence of special dis-

eases of these organs but to discover early indications of grave disorders which may not be far enough advanced to reveal themselves through more prominent symptoms. For example, disease of the blood-vessels and of the kidneys may often be recognized by examination of the eye. Morbid conditions of the nose frequently give rise to serious nervous and pulmonary disorders.

Examination of the Teeth. Unless known to be sound through the assurance of a competent dentist who has but recently examined them, the teeth should be thoroughly looked over, not merely to discover the beginnings of dental decay but to note whether the teeth are in condition to thoroughly masticate the food, and also to make sure that there are not present in the mouth septic conditions which may serve to perpetuate a state of intestinal auto-intoxication.

The Electro-Cardiograph. This newly perfected apparatus gives a graphic record of the action of the heart, by means of which the slightest variation from the normal may be determined. This method places in a clear light cases which were formerly in the highest degree obscure, and is one of the most important applications of modern instruments for electrical measurements to the study of human maladies. The special apparatus which has been at large expense imported from Germany for use in this department is the latest and most improved form of electro-cardiograph which has been thus far developed and is the first apparatus of the improved type to be introduced into this country.

General Physical Examination. Thorough physical examination in every case is necessary to obtain as much information as possible concerning the heart, lungs, and abdominal viscera, as well as to make a general inventory of the physical condition of the body.

Many of the examinations in the foregoing list should be repeated from time to time as the only means by which the degree of progress the patient is making may be accurately measured. The advantage of such exact examinations cannot be overestimated, not only as a guide to the physician in the application of the curative measures but also as a means whereby the patient may be enabled to see for himself at a very early period the effects produced by his treatment, and thus to form a reasonably accurate judgment respecting the ultimate outcome of his therapeutic effort.

A Natural Bill of Fare

The Sanitarium bill of fare excludes meats, animal fats, mustard, pepper, and other irritating condiments, spices, tea and coffee, pickles, ice cream, baking-powder breads, and all articles of food known to be unwholesome, indigestible, or productive of disease,—and here are a few of the reasons why:

Condiments, such as mustard, pepper, capsicum, etc., cause blistering and inflammation of the skin when applied to it; when applied to the stomach they produce similar irritation, and their habitual use produces gastric and intestinal catarrh. In those parts of Old Mexico where peppers are freely used, chronic gastritis is almost universal. This the writer knows from personal observation, as well as from the testimony of intelligent American physicians who have practiced medicine in the Mexican Republic for many years. The idea that pepper and similar substances aid digestion is entirely an error. Comparative experiments made by giving the patient test meals with and without pepper, mustard, etc., show that condiments hinder rather than aid digestion.

Experiments on animals made by French and German investigators with extracts of mustard,

pepper and other condiments show that these substances produce hardening of the arteries. Their use is positively dangerous in persons with high blood-pressure. Those who wish to live out the total measure of their days will do well to avoid them.

Pickles, being hardened by the action of acetic acid and salt, perhaps with the addition of alcohol, become almost absolutely indigestible. When taken into the stomach they resist the action of the gastric juice much as would sawdust or pebbles, and become a source of great irritation and even of inflammation and chronic disease. Green olives, brandied peaches, and even preserves must be put in the same category. Fresh, crisp cucumbers are very wholesome for persons whose digestive organs are in a fair condition. Lemon juice should be substituted for vinegar. The acid of vinegar has been shown by Boix to be twice as active as alcohol in producing gin liver. It is quite unwholesome for well persons, and must be rigorously excluded from the bill of fare of the invalid.

Animal Fats, together with olive oil and other non-emulsified fats, when mixed with starch, as buttered toast, cake, piecrust, griddle cakes, Saratoga chips, fried bread, fried mush, baked, boiled and mashed potatoes, etc., prevent the action of the saliva upon the starch. Fats also hinder the action of the gastric juice upon the albumins, and, as shown by Pawlow, diminish the formation of gastric juice, and in this way give rise to biliousness, so-called torpid liver, and other digestive disturbances. Fats are easily digested and assimilated only when taken in the form of natural emulsion, as in cream, in nuts, or nut preparations.

Butter, unless made from sterilized milk, contains germs in great quantities; even the germs of tuberculosis and typhoid fever have been found in butter which had been made several weeks. The

butter used upon the Sanitarium tables is made from sterilized milk, and so is free from noxious germs. Rancid butter is highly injurious, not only because of the germs which it contains but because of the unwholesome effect of the butyric acid present. Pawlow has shown that this acid irritates the stomach in such a way as to cause it to produce an excess of acid. On this account it is especially important that persons suffering from gastric hyperacidity should avoid the use of butter which has the slightest taint.

Cheese must be condemned for the same reason, with the exception of Yogurt cheese. The Yogurt cheese which is used on the Sanitarium tables is prepared in the Sanitarium creamery by the aid of the famous Oriental ferment, the *Bacillus Bulgaricus*, and is not only a wholesome and most palatable food but is also a useful remedy, since it introduces into the alimentary canal friendly germs which combat the poison-forming organisms which cause intestinal autointoxication.

Why Flesh Meats are Excluded

Flesh foods of all sorts, including red meats, fish, flesh, fowl, oysters, clams, lobsters, etc., are excluded from the Sanitarium bill of fare for several excellent reasons:

1. *The great majority of invalids are suffering the ill effects of flesh eating.* Rheumatism, gout, certain forms of Bright's disease, gall-stone, renal calculi (stone in the kidney), many forms of neurasthenia, migraine or headache, gastric ulcer, hyperacidity, and many other maladies belong to a class which has been aptly designated as "meat-eater's disorders," because directly promoted by flesh eating.

The observations of Combe, Tissier, Metchnikoff and others have shown that flesh foods promote intestinal autointoxication. There are two reasons

for this. Flesh rapidly undergoes putrefaction within the body as well as outside of it. The same germs which cause the offensive decay of a dead rat are found present in beefsteak, fish, fowl, oysters and flesh of all sorts. The following table shows the number of bacteria found in different samples of meat freshly obtained and examined in the Sanitarium clinical laboratory:

Specimen	Putrefactive Bacteria per gram (moist)	
	When purchased	After 20 hrs. at room temp.
No.		
1. Large sausage	420,000,000	490,000,000
2. Small sausage	663,000,000	640,000,000
3. Round steak	560,000,000	840,000,000
4. Roast beef	560,000,000	750,000,000
5. Smoked ham	43,120,000	750,000,000
6. Hamburger steak	129,000,000	700,000,000
7. Pork	126,040,000	1,036,000,000
8. Porterhouse steak	30,000,000	700,000,000
9. Sirloin steak	378,000,000	.....
10. Tenderloin (well done)	25,200,000	.....
11. Tenderloin (rare)	168,000,000	.....

Second, flesh foods encourage intestinal auto-intoxication by supplying the sort of material which promotes the growth of poison-forming germs. The samples of meat examined and shown to have the number of bacteria indicated in the above table were taken from portions of meat about to be served on the table of a first-class hotel, and represent meat in the form in which it is ordinarily eaten.

Uric Acid Facts

Persons who are suffering from uric-acid poisoning—and cases of this sort are exceedingly numerous—will be interested in the following facts worked out by Dr. Hall, the eminent physiologist

of Manchester, England, concerning the amount of uric acid found in meat and other common articles of food:

A pound of beefsteak contains fourteen grains of uric acid. The amount produced and eliminated daily by a person living on a non-flesh diet is only six grains, or less than half the amount which is swallowed in eating a pound of beefsteak.

A pound of liver contains nineteen grains of uric acid, or three times as much as the body ordinarily discharges in one day.

A pound of sweetbreads contains seventy grains of uric acid, or more than twelve times the amount which the body is normally required to dispose of in a day.

Chicken, fish, oysters, and other flesh foods contain uric acid in about the same proportion as beefsteak.

A pint of beef tea contains eight grains of uric acid, or twice as much as the same quantity of urine.

A person's liver and kidneys may be able to destroy and eliminate the uric acid produced in his own body, while not at all prepared to deal with two to ten times this quantity.

Nuts of various sorts are the vegetable analogue of meat, and require only suitable preparation to render them not only exceedingly palatable, but in the highest degree wholesome and digestible. The invention of methods by which this can be done, and the discovery of such interesting preparations as protose, malted nuts, nut butters, creams, etc., has made it easily possible for any person to at once and entirely dispense with the use of flesh foods.

Dujardin-Beaumetz, the most eminent medical practitioner of Paris, himself a sufferer from Bright's disease, prolonged his life many years by discarding flesh foods of all kinds.

Meat must be entirely avoided by persons suffering from gastric disorders—either hyperpepsia or hypopepsia. Those who have hypopepsia have not the ability to digest flesh foods because of the deficiency of gastric juice, the element essential for the digestion of this class of food substances.

In cases of hyperpepsia, as shown by Pawlow and numerous other investigators, an excessive production of hydrochloric acid is increased by the use of flesh food. In cases of dilatation of the stomach in which the chief inconveniences are the outgrowth of too long retention of foods in the stomach, meats as well as cheese, and in many cases even milk and eggs must be avoided, because of the putrefaction of these substances in the dilated or pouched stomach, giving rise to the formation of poisons. When absorbed into the blood, these poisons cause sick-headache, palpitation of the heart, biliousness, and even degeneration of the kidneys or Bright's disease, and inflammation with cirrhosis and atrophy of the liver.

Healthy people soon become sick when fed exclusively on meat; even dogs become sick and die on an exclusive meat diet. Dog fanciers give dogs very little meat, and the keepers of trained dogs exclude meat entirely from their dietary. Hunters feed their dogs cornmeal cakes, asserting that the use of flesh spoils the dog's wind and also his scent. Flesh foods are not the natural diet of man, who is naturally, according to Cuvier and other comparative anatomists, a frugivorous or a fruit- and nut-eating animal.

3. Chittenden and others have demonstrated the necessity for a *low-protein standard in diet.* The experiments of Chittenden and numerous other investigators have shown that the amount of protein formerly supposed to be necessary is about three times as much as the body actually requires. By

the aid of experiments conducted by Chittenden, in which more than a score of men lived upon a low-protein diet for nine months, it has been shown that the necessary amount of protein (the food element represented by the lean of meat and the white of egg) is so small that an ample supply can be obtained from vegetable sources, so that it is not at all necessary to resort to the eating of flesh foods in order to obtain a supply of this element. All of the persons who were the subjects of the experiment improved. Six athletes who were in good condition at the beginning of the experiment doubled in strength. Experiments made by Fisher have shown that the endurance of flesh-abstainers is far greater than that of flesh-eaters. One of these tests consisted in holding the arms straight out until they could no longer be maintained in a horizontal position. Fifteen flesh-abstaining physicians, nurses and bath attendants of the Battle Creek Sanitarium corps were able to hold out their arms nine times as long as fifteen of the well-trained athletes of the Yale gymnasium. The facts were published by Professor Fisher of Yale University, who conducted the tests in a most thoroughly scientific manner.

Beef tea, beef extracts, beef juice, bouillon, etc., contain little or no nourishment, consisting chiefly of the waste matters derived from the tissues of the dead animal—uric acid, creatin and other poisonous substances. An ounce of beef broth contains only three calories of food substance, barely as much as a small teaspoonful of milk. An eminent French physician remarked: "Beef tea is a veritable solution of poisons." The late Dr. Austin Flint made an examination of beef tea and found its composition to correspond very closely to that of urine. A pint of beef tea contains more than twice as much uric acid as the same quantity of urine. These preparations should be wholly discarded from the dietary of both the well and the

sick. They are particularly unwholesome for the sick, whose power to deal with poisons is impaired.

Eggs are somewhat less objectionable than flesh foods, yet when freely used they encourage intestinal autointoxication and may be well discarded by persons who are anxious to escape as speedily as possible from the distressing inconveniences of chronic intestinal toxemia. The yolks are preferable to the whole egg, for the reason that they are intended as a foodstuff for the developing chicken and are much more easily digestible. Fried eggs and omelets are very difficult of digestion, hence are unwholesome and should be avoided.

The Antitoxic Diet

A fruit diet is of the highest value in cases of chronic disease, especially when the stomach is infected with germs. Germs will not grow in fruit juices. Even cholera and typhoid fever germs succumb in a short time to the influence of the juices of such fruits as the orange, the lemon, the apple and the strawberry. A fruit diet is the best means of disinfecting the stomach and the alimentary canal in general. An exclusive fruit dietary for three or four days is sometimes advantageous. In other cases a fruit breakfast, a fruit supper, and a mixed diet for dinner, is a practical plan. Fresh ripe fruits are somewhat more effective than stewed fruits for the destruction of germs. In several cases which have been under treatment at the Sanitarium the stomach fluid has been found to contain more than two hundred and fifty million germs to the ounce. After a test meal, consisting exclusively of fruit, no living germs could be found.

Fruits should be masticated with great care. Fruits are not digested in the stomach, and hence must be reduced to as nearly a liquid state as possible in the mouth by thorough mastication. Neglect to do this is the principal cause for inconvenience

from the use of fruits, of which many invalids complain. Bananas, which are thought to be quite indigestible by many, become readily digestible when reduced to a smooth pulp before eating or by means of thorough mastication.

Strongly acid fruits sometimes interfere with the digestion of starch in the stomach, and in such cases should be avoided or eaten only at the close of the meal.

In the use of melons, the pulp should be rejected; the juice only should be swallowed. Fruits, with the exception of the banana and the olive, contain but very little nutrient material, consisting chiefly of water; they tax the digestive organs but very little, and may therefore be taken when other foods cannot be eaten.

Fruit juices require no digestion, and hence may be taken between meals without taxing the digestive organs. The nourishment which they contain is ready to be immediately absorbed and assimilated. This fact explains the peculiarly refreshing properties of fruit juices. Fruit juices containing considerable quantities of cane sugar are very objectionable on account of the irritating effects of this sugar, which is not a natural foodstuff. Fruit juices should not be swallowed rapidly, but should be sipped slowly and mixed with the saliva.

Cereals of all sorts are highly antitoxic. This is especially true of dextrinized cereals. Experiments have shown that rice is the most antitoxic of all cereals. The reason for this is that the starch of cereals encourages the growth in the intestines of the acid-forming germs which prevent the development of the poison-forming putrefactive germs. Meltose, malt honey in the form of syrup and in the form of sugar, are highly valuable antitoxic foods, as they greatly encourage the growth of the friendly germs or antitoxic ferments.

Vegetables

Fresh vegetables may be freely used, if care is taken to thoroughly masticate each morsel. Their use is important to give bulk to the food mass, so as to encourage intestinal activity and also to supply the body with useful salts.

Such fresh green vegetables as lettuce and raw cabbage should be used freely when not contraindicated by chronic inflammation of the stomach or by some other morbid condition which renders the stomach incapable of dealing with bulky foods. Lettuce and cabbage are often contaminated with the eggs or embryos of intestinal parasites as the result of the use of fresh manure or night soil as a top dressing by gardeners. Metchnikoff has called attention to the fact that certain forms of intestinal parasites are generally acquired in this way. It is claimed by Metchnikoff that appendicitis and typhoid fever may be often traced to the use of raw vegetables which have been thus affected. This danger is entirely avoided at the Sanitarium by the production of lettuce and other vegetables which are eaten in a raw state, in gardens and greenhouses connected with the institution. Fresh fruits which are purchased in the market are submitted to a thorough washing and disinfection by means of harmless germicides.

The potato is in general a most wholesome vegetable but must be avoided in certain cases in which there is great gastric irritability, because of the large amount of alkaline salts which it contains. In such cases rice is much preferable, as the rice contains less than one-twenty-fifth part as much of these salts as does the potato. In the use of potatoes, it is highly important that each morsel should be thoroughly chewed. It must be reduced to a perfect liquid state before leaving the mouth. When swallowed in lumps, potato is almost indigestible in the stomach, as it consists so largely of starch.

When thoroughly reduced to a liquid state, the potato leaves the stomach very quickly and enters the intestine, where it is digested by the pancreatic juice. Soggy potatoes are very indigestible because of the difficulty in reducing them to a liquid state. The potato is highly antitoxic and is recommended by Metchnikoff and his pupils.

Why Cane Sugar is Discarded

1. Cane sugar is not a natural human foodstuff. It is chiefly found in grass-like plants such as sorghum and the sugar cane, in roots and the sap of certain trees.

2. Cane sugar is digested with difficulty by the human digestive apparatus. One of the four stomachs of ruminants is specially provided with a ferment for the digestion of cane sugar. In the human intestine the digestion of cane sugar does not begin until three or four hours after it is eaten.

3. Cane sugar is irritating to the stomach. Brandel, a German investigator, showed in experiments upon a dog that irritation of the stomach was caused by a 6 per cent solution of cane sugar. A 20 per cent solution produced such irritation and distress that it was necessary to terminate the experiment.

4. Cane sugar often produces acidity by irritating the stomach and causing an excess of gastric acid. The acid is not due to fermentation but to irritation.

5. Cane sugar, when taken freely, produces gastric catarrh.

6. Cane sugar is an objectionable form of carbohydrate food because it lacks the lime and other bone-making salts which are naturally, as in the cereals, associated with carbohydrates. Professor Sherman, of Columbia University, has shown that the free use of cane sugar is largely responsible for the lime starvation from which about one-

half of the population of the United States, according to his estimate, are suffering. According to the United States government statistics, the average American citizen eats a quarter of a pound of cane sugar daily. With this amount of carbohydrate food should be associated a considerable proportion of lime. This not being supplied, the bony structures of the body suffer as a consequence, and the rapid decay of the teeth is one of the results.

A recent official inspection of the public schools of one of our large cities showed that 90 per cent of the children were suffering from decay of the teeth.

The sugars to which the stomach is naturally adapted are milk sugar, or the sugar which is normally found in milk; malt sugar, which is produced by the action of the saliva upon the starch; and fruit sugars, dextrose and levulose, which are found in fruits, also in honey. Fruit sugars in the form of sweet fruits, as raisins, figs, prunes, and other sweet fruits are much preferable to cane sugar. They are ready for immediate absorption and assimilation.

Malt Sugar

Malt sugar in the form of malt honey or Meltose, a syrup, and in the granular form resembling brown sugar, may be with advantage very largely substituted for cane sugar. The excellent flavor of these products combines well with the various cereals and with fruits of all sorts. Persons suffering from hyperacidity, gastric catarrh, Bright's disease, arteriosclerosis, apoplexy, gastric ulcer, colitis, should use malt sugar instead of cane sugar. Herschel, of London, has recently called attention to the fact that malt sugar serves a useful purpose in cases of ulcer of the stomach and duodenum if taken a couple of hours after eating, by checking the digestive action of the gastric juice upon the mucous membrane.

Dextrinized Cereals

Dextrinized cereals, that is, cereals which have been cooked at a temperature of 400° F. or above, are much more easily digestible than are the ordinary cereals. In the process of digestion, starch is converted into fruit sugar, passing through many different stages. Ordinary cooking or boiling starch converts it into paste; this renders its digestion in the stomach possible, if it is retained there for a sufficient length of time. The saliva can not act upon raw starch. A more prolonged cooking, at a higher temperature, produces a higher form of dextrin, which is soluble and is more easily acted upon by the saliva. Cooking at a temperature of 320° produces achroodextrin, which is rapidly converted into malt sugar when brought in contact with the saliva. Malt sugar, while passing through the mucous membrane of the intestine, is converted into dextrose, in which form it is absorbed into the blood. The purpose of cooking should be to bring the starch as nearly as possible into the form of sugar, so as to tax the digestive organs as little as possible. The use of foods thus dextrinized by cooking at a dry heat of 320° is especially necessary in cases of hyperpepsia, in which the period of starch digestion in the stomach is very short, instead of continuing thirty or forty minutes, as in the normal stomach.

The following foods are dextrinized cereals, which are both more palatable and more digestible, even for the well: Browned rice, toasted rice flakes and biscuit, toasted wheat flakes, toasted granose biscuit, granola, zwieback, crystal wheat, toasted whole-wheat wafers. Granola, crystal wheat, and browned rice are served as moist cooked grains, and should take the place of oatmeal, cracked wheat, and other mushes.

Malted Cereals

In certain extreme cases starch digestion is so deficient that this element of food must be not only dextrinized but converted into maltose by predigestion by diastase. This predigestion of cereal foods does not weaken the digestive organs, but aids them by bringing cereal preparations as nearly as possible to the condition of well-ripened fruits. Chemical changes which take place in the process of ripening, and those which may be produced by cooking, are almost identical in character as regards the changes effected in the starch, the only difference being that under the influence of sunlight the digestion of starch is made more complete than it can possibly be made by any process of cooking or artificial digestion. The following are the principal malted foods: Granuto, bromose, malted nuts and malt honey. These preparations may be used in many cases in which cane sugar cannot be at all employed. Combe has shown that malted or predigested foods are highly antitoxic.

Why Tea and Coffee Are Discarded

Tea and coffee are discarded from the Sanitarium bill of fare because they are poisons, mild intoxicants, capable of producing decidedly injurious effects upon the nervous system, and highly detrimental to digestion. The digestion of starch ceases entirely in the presence of tea or coffee. Tea is, on the whole, more detrimental to starch digestion than coffee, but both are in the highest degree objectionable. They interfere with the action of the salivary glands by rinsing the food down before it has been properly insalivated. They prevent the action of the saliva upon the starch both in the mouth and in the stomach. Sir Wm. Roberts showed that tea

and coffee interfere with the digestion of albumin, and that their total effect is to delay or prevent digestion. Many dyspeptics know this by experience. Dr. Haig has shown that their effect is the same as that of meat-eating in producing sick-headache, rheumatism, and other uric-acid disorders.

Tea and coffee contain caffein, a poison which is essentially identical with uric acid.

A pound of tea, coffee, cocoa, or chocolate contains from 150 to 200 grains of uric acid, or its physiological equivalents, thein, caffein, or theobromin.

The habitual use of this poison is undoubtedly a potent cause of arteriosclerosis and high blood-pressure, and leads to Bright's disease and apoplexy. Dr. H. W. Wiley has pointed out that a cup of coffee contains four grains of caffein, which is a medicinal dose of the drug. A glass of coca-cola contains the same amount of caffein. A cupful of coffee contains twice as much uric acid as the same quantity of urine. These poisonous drugs are responsible for a vast deal of mischief. Their use should be discarded by persons in health as well as by the sick.

The Number of Meals

Two meals a day are, for most persons, preferable to three meals or more. This is especially true when the digestion is slow. The average person's stomach retains the food from four to six hours. The stomach should be allowed an hour to rest after a meal is digested before another meal is taken; and, as at least three or four hours should elapse before retiring, after the last meal, it requires very little computation to show that it is impossible to eat more than twice a day and comply with physiological requirements. Two meals a day has been the general custom of the world from the earliest period. 8 A. M. and 2 P. M. are con-

venient hours. While getting accustomed to this plan one may eat a little fruit at midday or in the evening to relieve the sensation of hunger. Many persons have adopted the "no breakfast plan" with benefit; but the no supper plan is preferable, in that it admits of sound sleep, a clean tongue, sweet breath, and a good appetite for breakfast, with power to digest and assimilate it. The "no breakfast plan" is specially suited to persons who take six o'clock dinners, for the reason that the stomach is jaded in the morning and not prepared for the work of digestion. The practice of making the hearty meal of the day at six o'clock or later is often responsible for insomnia and various forms of indigestion.

Persons who take liquid meals, or who take but small quantities of food, may sometimes do better with three or four meals daily. When necessary in such cases, which are very rare, a special prescription is given by the physician.

Thorough Mastication

Nearly twenty years ago, granose flakes, the first toasted flaked cereal, was produced at this institution, the purpose being to provide a dry food which would encourage mastication. Each flake of granose is a filmy bit of zwieback. It was for a long time the custom of the institution to require each patient to masticate at the beginning of each meal a saucer full of dry granose flakes. This proved to be an effective means of correcting numerous gastric troubles. The use of dry foods is preferable in the great majority of cases of indigestion, chiefly for the reason that they demand thorough mastication and insalivation. It is not necessary that the food should be hard, as is the case with zwieback, but it must be dry. Granose flakes, granose biscuit, rice flakes and biscuit are very palatable and may be easily masticated, even

without the aid of teeth. Whole wheat sticks, laxative or bran biscuit and other water breads are also excellent articles to encourage mastication.

The great attention devoted to the subject of mastication by the scientific world within recent years, as a result of the unique and most successful propaganda conducted by Mr. Horace Fletcher, has placed the importance of thorough mastication and mouth digestion upon a thoroughly scientific basis. The numerous important facts developed by Mr. Fletcher in his study of the subject of mastication have fairly entitled him to the high compliment paid him by the creation of the new terms "fletcherism" and "fletcherizing."

Thorough mastication of the food is to be especially commended for the following reasons:

1. Mastication develops the flavors of the food and thus stimulates the gustatory nerves to notify the stomach through the psychic centers, thereby enabling the stomach to prepare in advance the gastric juice required for the digestion of the food. This "appetite juice," discovered by Pawlow, is a most important element of the gastric secretion, being more active and powerful than any other.

2. Prolonged mastication secures the admixture with the food of the saliva required to digest the starchy portion, and thus prepares the food for the action of the gastric juice and other juices later on. The action of the saliva is not confined to the mouth; it is continued in the stomach, and although it is interrupted by the secretion of the acid gastric juice the saliva is reactivated by the digestive fluid after the food mass leaves the stomach and so continues its work in the intestine. This fact, recently discovered, greatly emphasizes the importance of securing an abundant secretion of saliva by thorough and prolonged mastication.

3. By thorough mastication the food is finely divided so that the various digestive fluids may

come in direct contact with each minute particle, thus greatly facilitating the process of digestion.

4. By thorough mastication the gustatory nerve is enabled to exercise a most interesting and important function by which the nutrition of the body is very exactly and automatically regulated. When the proper opportunity is thus afforded for the performance of its function, the gustatory nerves not only determine the amount of food but indicate which particular foodstuffs are required to meet the nutritive needs of the tissues.

Thorough chewing of the food need not be a tedious matter; in fact, the proper chewing of the food really increases to a marked degree the pleasure and satisfaction of eating. The length of time required need not be more than thirty or forty minutes for an ordinary meal. When the food has been sufficiently masticated, it seems to be drawn into the throat by a semi-automatic process, or, as one has said, "swallows itself." The tongue, as well as the teeth, should be used in masticating the food, not only by rolling the food about but by pressing it against the roof of the mouth, by which means also the presence of uncrushed particles may be detected and detained. In many cases it is better to reject the coarse hulls of beans, peas and green corn. These are sometimes retained in the stomach, especially in cases of dilatation.

Milk Dyspepsia

One-third to one-half of all invalids have learned to recognize by their own experience that milk does not agree with them. Combe has pointed out the fact that many invalids suffer from "casein dyspepsia." Many persons suffer from coated tongue, constipation and headache after the free use of milk, a condition which is often described as "biliousness." This is found to be especially true when rich milk or cream is freely used. These

symptoms are the result of intestinal autointoxication, which is produced by the putrefaction of undigested curds in the colon. The presence of a considerable amount of fat in the milk encourages the autointoxication.

Buttermilk or sour milk is preferable to sweet milk. Yogurt buttermilk is preferable to ordinary buttermilk. It is prepared under the supervision of our bacteriologist by the aid of the Oriental ferment, the *Bacillus Bulgaricus*.

Many who cannot use milk in any form find it advantageous to substitute Malted Nuts, a preparation somewhat similar in appearance and flavor to malted milk but more digestible and more palatable. Ordinary commercial milk is quite unsafe and unfit for use, as it often contains billions of germs to the ounce. Sterilized or boiled milk is unquestionably constipating and otherwise objectionable in many cases. The milk served to Sanitarium guests is produced by a special dairy which is under the constant supervision of officials of the institution and is produced under the conditions required for which is known as "certified milk." In addition, bacteriological examinations are made weekly in the Sanitarium laboratories.

The Antitoxic Regimen

In combating intestinal autointoxication, the first essential is to suppress foods which encourage the growth of the poison-producing germs,—that is, foodstuffs which readily undergo putrefaction. This includes meats of all kinds, and not infrequently also eggs. Many cases also require the suppression of milk, at least for a time. Instead of meats, the dietary must consist of foodstuffs which do not putrefy but on the contrary encourage the growth of acid-forming germs, the friendly organisms which combat poison-forming germs. Cereals, sweet fruits,

fruit juices, especially dextrinized and malted cereals and malt sugar, are the best for this purpose.

Another measure of great importance is the use of antitoxic ferments. Poehl, of St. Petersburg, discovered more than twenty years ago that intestinal putrefactions may be suppressed by the use of sour milk. Tissier, of the Pasteur Institute, discovered that fermented milk combats intestinal putrefaction by reason of the acid-forming germs which it contains. A very active germ, the *Bacillus Bulgaricus*, was found to be the secret of the special value of the fermented milk commonly used in Bulgaria and in Oriental countries generally, and known in these countries under the various names of *yoghourt*, *madzoon* (Turkey), *leben* (Egypt), *dadhi* (India). Careful study has been made in the clinical laboratories of the Sanitarium of ferments obtained from these different countries, and it has been ascertained that some are very much more active than others and that all are more active than most of the cultures sold under various trade names. The most active ferments of all were obtained from the vicinity of Mount Ararat in Mesopotamia and from India.

The Sanitarium tables are supplied with preparations of these ferments in the form of Yogurt buttermilk, made fresh every day in the Sanitarium creamery. The ferments are also prepared in the form of tablets or capsules. The use of Yogurt in the form of Yogurt buttermilk, Yogurt whey, Yogurt tablets and delicious Yogurt cheese, which is made from it in the Sanitarium creamery, has been found exceedingly helpful in combating intestinal autointoxication.

Various European bacteriologists have demonstrated that the intestine of an infant, as well as of the young of all species of animals, is at birth entirely free from bacteria. Within a few hours—six hours in summer, and twenty hours in winter—the intestine becomes occupied with a bacterial flora

consisting chiefly of two species, one which grows freely when exposed to the air, known as the *Bacillus acidiparalactici*, and another, a germ which grows best in the absence of air, the *Bacillus bifidus*. Both of these bacteria produce lactic acid, which prevents the growth of putrefactive bacteria and thus exercises a disinfectant or antiseptic influence in the intestinal canal of the infant,—the *Bacillus acidiparalactici* thriving in the small intestine, where air is present, and the *Bacillus bifidus* flourishing in the large intestine, from which oxygen is absent.

So long as these wonderful watch-dogs, the *Bacillus acidiparalactici* and the *Bacillus bifidus*, are present, the infant thrives. But infants fed upon cow's milk or fed artificially become infected very often with putrefactive organisms. Not infrequently the intestinal putrefactions become so intense that the child dies of autointoxication. Probably more young infants die as the result of these intestinal putrefactions than from any other cause.

In other words, nature makes of the infantile intestine a flower garden, filling it immediately after birth with protective acid-forming germs by which health is insured so long as the flowers continue to flourish; but when weeds, in the shape of putrefactive germs, get into the flower garden through wrong feeding and other means, the friendly germs disappear, the body is flooded with poisonous substances which take the place of the protective acids, and disease results.

Tissier, the great bacteriologist of Paris, who made these observations, was quick to recognize the fact that if by some means the weeds could be driven out and the normal flora restored, the return to natural conditions would be speedily followed by the disappearance of disease. Experiments upon animals, extended to infants and adult human beings, showed that this might be readily accomplished by suitably prepared cultures of the

Bacillus acidiparalactici and the *Bacillus bifidus.* These facts were communicated to the Society of Biology by Dr. Tissier in February, 1906, since which time many thousands of lives have been saved by the use of Professor Tissier's culture.

Experiments conducted in the clinical laboratory of the Sanitarium have led to the preparation of a ferment which combines the advantages of Tissier's culture and Yogurt. This culture is known as Tissane.

This department has the advantage of constant advice and counsel from Professor Tissier, who is Consulting Bacteriologist to the institution.

Intestinal Activity

Increased activity of the bowels is found to be necessary in most cases of chronic disease; even in cases in which the bowels move every day there is often found a putrefying residue left behind in the colon which is never completely evacuated. Constipation is an almost universal disease among civilized people as a result of an unnatural dietary and deficient muscular activity. Normally, the bowels should move after each meal, or two to four times daily. This prevents the retention of food remnants, bile and other excretions in the intestines long enough to permit of any considerable degree of putrefaction. This increased bowel activity is highly essential for the cure of intestinal autointoxication. How to secure it without the use of harmful means is one of the most difficult problems with which the therapeutist has to deal.

In most cases a combination of therapeutic measures is necessary. One of the most valuable which has been discovered in recent times is the use of the Japanese seaweed agar-agar. This substance is used as food in Japan, where it takes the place of the animal gelatin so much used in this

country, to which it is in every way superior. This substance is supplied to Sanitarium patients in the form of small biscuit under the name of Colax. The use of Colax at each meal is a valuable means of securing a very satisfactory increase of intestinal activity. The free use of fresh fruits and of such fresh uncooked vegetables as lettuce and the tender leaves of cabbage, together with other laxative foods, is essential in combating intestinal autointoxication. The mechanical kneading of the abdomen, massage, hydrotherapy, applications of electricity, local treatment of the bowel, and in some cases surgical measures, are other means employed as indicated.

The Battle Creek Sanitarium Diet System

This institution was the first (and in that particular is still unique) to provide its patients with a scientific bill of fare so arranged as to make possible the exact regulation of the diet in quantity and quality. Every article on the bill of fare has been examined by expert chemists and its value determined. A little instruction from the dietitians, who are always in the dining-room during meal time, shows the patient how to arrange his bill of fare so as to secure just the right amount of fats, carbohydrates, proteins and other elements, as may be ordered by the physician.

This scientific accuracy puts the health-seeker on the road to recovery so quickly that he enters into the scheme with enthusiasm and counts his "calories" or his "portions" with interest, reporting to his physician and making a record in his "book" provided for the purpose.

Every patient may read with profit the "Sanitarium Diet List," a little book containing a wealth of useful information.

Body Training

Most chronic invalids have badly depreciated bodies. Their muscles are weak and flabby, they have feeble hearts, shallow breathing, flat chest, round shoulders, and little endurance. These conditions are the natural results of malnutrition and the chronic toxemia nearly always present. This state of physical inefficiency must be combated not only by removal of causes but by systematic training of the heart and muscles by scientific physical culture.

Systematic exercise of some sort is thus an essential feature in the Sanitarium system of treatment. The fatigue and muscular soreness occasionally produced at the start disappear rapidly when exercise is taken systematically. By means of exercise, heart and nerves as well as muscles are strengthened, and the tissue changes necessary for a thoroughgoing cure are encouraged.

The breathing exercises before breakfast prepare the stomach and liver for the digestion of the coming meal. After-dinner exercises aid the stomach in its digestive work, relieving heaviness and other discomforts. All exercises which accelerate the breathing aid greatly in the absorption of fluids from the stomach and intestines, and in this way greatly promote digestion and nutrition.

The gymnasium work prescribed to be taken at other times has for its purpose the general improvement of the system and the correction of various deformities, such as round shoulders, flat chests, weak abdominal muscles, spinal curvatures of various sorts, weak carriage in walking, malpositions in sitting, etc. Persons who have very feeble abdominal muscles or prolapsed viscera should wear an abdominal supporter while taking exercise until the muscles have been developed.

In this connection should be noted the Sanitarium Chair, so called because constructed espe-

cially for this institution. The curves and slope of the back are such as to support the trunk and hold up the chest, and thus preventing the harmful relaxation of the abdominal muscles, which causes prolapse and congestion of the liver, stomach, bowels, and other viscera, and robs the brain and other organs of their proper blood supply. The chair is a constant reminder of the injunctions of our gymnasium trainers to "hold the chest up."

The gymnasium department is in charge of experienced trainers, who, with the assistance of the physicians, will see that each patient receives the special exercises adapted to his particular case. Exercise in the fresh air, either out of doors or in the enclosed corridors, should be taken at stated hours daily as one of the most efficient means of promoting appetite, good digestion and tissue rebuilding.

Every patient is expected to have a strength test by the dynamometer and a strength graphic made before beginning exercise. Other tests should be made at intervals to show the progress being made from week to week, and a final test should be made just before the patient goes away, so as to have a record of the improvement made.

The Fresh=Air Cure

The experience of recent years in hundreds of sanatoria for consumptives has demonstrated the immense value of the open air, especially of cold air, as a means of cure. Sixty per cent of cases of consumption are cured in these establishments by fresh air alone. Fresh air is just as useful in the treatment of other chronic maladies as in consumption. In combination with the antitoxic diet and multivaried health-promoting methods and measures, the value of the fresh-air cure cannot be overestimated.

Every patient not otherwise instructed is expected to spend as much time as possible in the open air and to sleep with open windows at night. There are outdoor walking-parties daily, rides, excursions, and "outings" which are entertaining as well as recreative.

Hydrotherapy

Hydrotherapy, or the use of water as a means of cure, is chiefly relied upon to stimulate the vital activities necessary for the curative process. By cold applications suitably applied, every bodily function may be stimulated. By hot applications properly applied, excessive action may be controlled, pains relieved, and blood diverted from congested parts. By various other applications most powerfully sedative, alterative, and restorative effects may be produced. Scientific hydrotherapy affords the most direct and most rapid means of influencing the great functions of life, the circulation of the blood, the process of respiration, the action of the brain and nerves, the functions of the liver, kidney, stomach, and bowels. There is no means by which the various bodily functions may be so perfectly and so quickly controlled as by hydriatic measures applied with intelligence and skill.

Cold applications, suitably managed, are essential to the production of strong and lasting tonic effects, so that, almost without exception, the physician aims to accustom the patient as rapidly as possible to the use of cold water by carefully graduated and progressive measures, which constitute what might be termed a hydriatic ladder up which the patient climbs. The series of measures may perhaps begin, in the case of a very feeble patient, with a wet-hand rub applied first to the back, then to the back and legs, and finally to the whole body. Beginning with 65 to 70 degrees, the temperature is lowered one or two degrees daily

to 40 or even 34 degrees. Next in order is the cold-mitten friction, graduating the temperature down from 60 to 40 degrees, followed by the cold-towel rub, graduating from 65 to 40 degrees. Then come in succession the wet-sheet rub, the half bath, and finally douches.

Packs, fomentations, applications to the spine, foot baths, sitz baths, and various other measures are used in connection with general cold applications to produce desired local effects; but the general cold applications must be progressively increased in intensity as a means of increasing vital resistance and raising the general tone of the system. If disagreeable effects are at first experienced from the cold application, these quickly disappear, and the exhilaration and the sense of well-being and buoyancy following the cold rub or douche will be ample compensation for the efforts made to accustom one's self to this most powerful of all known tonic remedies.

Phototherapy

The wonderful influence of the sunlight as a curative agent has been appreciated from the most ancient times. The Greeks and Romans provided most excellent arrangements for "insolation" or sun bathing in connection with their great public baths as well as in the palaces of the rich. Sick animals show a preference for the sun.

The discovery of the electric light, veritable resuscitated sunlight, has placed in our hands the means by which the powerful healing agent which permeates the body with its healing rays may be utilized at all seasons of the year. The arc light is called into service with special frequency in the cold months when the outdoor gymnasiums are not in use.

The electric light bath, now perhaps the most popular of all special forms of bath known to the

world, originated in this institution and was here used for several years before it was employed elsewhere. It was exhibited at the World's Fair in Chicago in 1893, and was thence introduced into Germany, where it was first used at the famous institution of the renowned Dr. Winternitz at Kaltenleutgeben. It is now used in all the leading hospitals of Europe and has for years been in use in the palaces of Emperor William, King Oscar, the King of England, and numerous other members of royalty and the nobility.

The electric light bath possesses all the virtues of the Turkish bath with none of its dangers and inconveniences, and adds the marvelous virtues of light. The luminous heat rays do not stop at the skin as does ordinary heat, but permeate the soft parts of the body in every direction, searching out painful and sluggish parts and imparting their powerful vital stimulus. Its value in the treatment of chronic maladies of all sorts can scarcely be overestimated. Its superior efficiency as well as its luxurious attractiveness are well attested by the fact that it has been more extensively copied and imitated than any other invention of the sort. The Sanitarium Electric Light Bath is without doubt the most important improvement in bath appliances that has been made in modern times.

Mechanotherapy

The Mechanotherapy department, in which the mechanical Swedish movements are given, is much appreciated. There are kneading machines for the abdomen, to stimulate sluggish bowels to normal action. There are vibrating chairs, tables, stools, and bars, which warm the extremities, dissipate weariness and the "numb," "cold," "creeping" and other queer sensations which worry the neurasthenic. It is really remarkable how quickly the heaviness and other discomforts which follow eat-

ing in many cases of dyspepsia disappear under the influence of vigorous vibration. Then there are rubbing and percussing machines, and other apparatus, all of which do something helpful. This department may be visited twice a day with profit by most patients. Improved new apparatus of the Zander type—the trotting horse, the camel, and various other machines—have been recently added to this department.

Diathermy, or Thermo-penetration. This is a new method of applying electricity in which the electrical current is converted into heat within the body. None of the ordinary effects of electricity are experienced; that is, there is no electrical sensation, no muscular contraction; the only sensation is that of warmth. By proper arrangement of the electrodes the heat may be concentrated in any part of the body. This invention renders it possible to apply heat to internal parts heretofore inaccessible.

This method has been found of very great advantage as a means of stimulating the activity of the liver, kidneys and other internal glands when inactive. It has also proved of great service in cases of dilatation of the heart. A dilated heart has been seen by means of the X-ray to contract under its influence. It is of great service in cases of arteriosclerosis, especially in cases in which the disease affects the vessels of the abdomen, the most common form of arterial degeneration.

Diathermy is highly useful in neuralgia of all forms, in migraine and other forms of headache; also in sciatica, neuritis and muscular rheumatism. It absorbs gouty deposits by raising the temperature of the blood and so rendering the uric acid deposits soluble. It is altogether one of the most useful additions which has been made to physiotherapy in recent years.

Radium Therapy. Recent scientific researches have shown radium to be a powerful curative agent

when properly applied. Pure radium is rendering great service in the treatment of cancers which have proved incurable by other means. While it is not by any means a panacea, a considerable number of persons have been cured by this means whose cases were otherwise incurable.

Radium Ionization is useful not only in the treatment of cancer but in the treatment of rheumatism and neuralgia. By this method radium is carried into the affected part by means of an electrical current.

Radium Emanation is perhaps, on the whole, the most useful form of radium as a therapeutic agent. The emanation is used in three ways:

1. The "drink cure," in which the radium emanation is taken in solution. The daily dose is divided into four parts, a dose being taken after each meal and on going to bed at night.

2. The electro-radium bath. The bath is taken in water to which the radium emanation has been added. By means of an electrical current, the entrance of the emanation from the water of the bath into the body of the patient is greatly assisted. The addition of the electrical current is an improvement which has been recently developed in this department.

3. Inhalation of radium emanation is probably the most effective of all means of introducing radium into the body. The apparatus used in this department was devised and made specially for this institution and is a great improvement over methods previously used.

High Frequency Electrical Treatment. This method employs electrical currents of the same sort as those which are used in wireless telegraphy, which were first discovered by Tesla but were first used in application to the human body by d'Arsonval. Properly applied, this current pro-

duces powerful effects in relieving pain, lowering blood-pressure, and in favorably influencing the various vital functions.

Vacuum and Vacuum Light Treatment. A special department has been fitted up for the application of the vacuum and other methods as used by Biers, Knapp and others. By the combination of light therapy in what is known as the light vacuum method, the good effects of these two powerful means of influencing the bodily functions are not only combined but intensified. This method is of special service in the treatment of sciatica, rheumatic joints, stiff joints and muscular rheumatism, deep-seated pains, old sinuses, furunculosis, scleroderma, and as a means of producing derivative effects in internal parts by developing collateral hyperemia of the skin.

Aerotherapy. In this method use is made of oxygen and of ordinary air at different pressures. By means of special apparatus air under increased pressure may be used, or air under diminished pressure. The latter method is of most service, being especially useful in cases of cardiac asthma, rigid chest and other cases in which the respiratory rythm is disturbed. Air under pressure is also used in this department, together with oxygen and medicated gases when required.

The air douche, consisting of a powerful current of air produced by special apparatus, which may be used either hot or cold, is another of the curative resources applied by this department. It is found to be very useful, relieving certain forms of pain and causing the absorption of gouty nodules.

A Scientific Method

The Sanitarium method is thoroughly scientific and cannot be carried on successfully without the information to be obtained through well-equipped laboratories and specially trained chemists, bac-

teriologists, and other experts in laboratory methods, as well as physicians, nurses, and attendants who have made a special exhaustive study of hydriatic and other physiological measures of treatment, and are thoroughly familiar with the technique as well as the general principles of hydriatic treatment. With these in hand, and the thorough co-operation of the patient, all curable maladies are curable by these methods perseveringly employed. The list of so-called incurable diseases has been largely diminished by the success obtained by these physiological methods. Even incurable cases may receive great benefit, for in a great majority of cases the disease can be arrested, or the rate of progress greatly lessened, and distressing symptoms may be wonderfully ameliorated if not wholly controlled.

The Battle Creek Sanitarium, which has been the nursery for the ideas set forth in the foregoing pages, represents a new departure in the treatment of the sick. For the first time in the history of medicine, the attempt was made to bring together under one roof all rational and scientific remedies for disease, and place these various means, hydriatic, electrotherapeutic, dietetic, physical, chemical, medicinal, and mechanical, in charge of thoroughly trained, scientific physicians, and to supplement the ordinary means of diagnostic research with complete laboratories for microscopical, chemical and physiological investigation in which cases of disease might be studied in the most elaborate manner and original researches undertaken for the purpose of eliciting new and useful information from nature's storehouse.

The Battle Creek Movement

The Battle Creek Sanitarium is not a hospital, neither is it what the public understands by a sanitarium or sanatorium,—which is a sort of medical boarding house,—

neither is it a headquarters for faddists and cranks. It is in no sense a commercial or mercenary enterprise. It is the center of a reform movement, the essential principle of which is to return to nature and seek for those paths which lead men to harmony with nature and with themselves. The movement which centers here in this institution has become world-wide and is making progress everywhere among intelligent and reasoning people of all classes. The corporate name of the Battle Creek Sanitarium is the Michigan Sanitarium and Benevolent Association, which is organized under the provisions of Act. No. 242 of the Public Acts of 1863 for the organization of charitable institutions, and is by statute exempt from taxation. No physician or any other person has any share of the earnings of the institution. All excess of receipts over expenditures is used in making necessary improvements, in providing treatment for the worthy poor, and in promulgating the principles of "right living." Physicians and other officials receive only moderate salaries and no fees. "Tipping" is not allowed.

Departments

The various forms of treatment administered in the institution are included in the following departments, in which treatment is regularly given at the hours specified:

Bath Department, 9:45 A. M. to 12:45 P. M. and 5 to 7 P. M.

Electrical Department, 9 A. M. to 1 P. M. and 4:30 to 6:30 P. M.

Static Electrical Department, 5 to 7 P. M.

Galvanic Department, 9 A. M. to 1 P. M. and 4 to 7 P. M.

Phototherapy, 11 A. M. to 1 P. M. and 3 to 7 P. M.

Manual Swedish Movements, 9 A. M. to 1 P. M., and 3 to 7 P. M.

Mechanical Swedish Movements, 9 A. M. to 1 P. M. and 3 to 6 P. M.

Massage, 9 A. M. to 1 P. M. and 4: 30 to 7 P. M.

Gymnasium, 7: 15, 9 A. M., 10: 00 A. M. to 12: 00 M., 3: 00, 4: 30, and 6: 45 P. M.

Roentgen Ray or X-Ray Department, 9: 00 A. M. to 1. P. M., and 4 to 6 P. M., except Wednesday, and by appointment.

Eye, Ear, Nose and Throat, 9 A. M. to 1 P. M. and 5 to 7 P. M.

Those who desire further information concerning the Battle Creek Sanitarium and the movement which it represents should ask for a copy of the Sanitarium Blue Book. Inquire at the desk, or address

THE SANITARIUM

Battle Creek, = Michigan

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